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THE PSYCHOLOGICAL IMPACT OF THE PUBLIC 2-YEAR COLLEGE ON CERTAIN NONINTELLECTUAL FUNCTIONS.

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THIS STUDY SOUGHT TO DETERMINE IF THERE ARE SIGNIFICANT CHANGES IN SELECTED PERSONALITY TRAITS, IDEOLOGIES, AND VALUES OF STUDENTS WHO ATTEND A 2-YEAR PUBLIC JUNIOR COLLEGE. A BATTERY OF PSYCHOLOGICAL TESTS WAS ADMINISTERED TO ALL PERSONS APPLYING FOR ADMISSION AS COLLEGE FRESHMEN FOR THE FALL SEMESTER OF 1960 AT ONE OF SIX CALIFORNIA PUBLIC JUNIOR COLLEGES. THE BATTERY CONSISTED OF FIVE SCALES FROM THE CALIFORNIA PSYCHOLOGICAL INVENTORY, THE ROKEACH DOGMATISM SCALE, FORM E, AND THE ALLPORT-VERNON-LINDZEY STUDY OF VALUES. USABLE RESPONSES WERE OBTAINED FROM APPROXIMATELY 4,500 WOULD-BE COLLEGE FRESHMEN. IN THE SPRING OF 1962, THE SAME BATTERY OF PSYCHOLOGICAL TESTS WAS SENT BY MAIL TO THESE SUBJECTS, AND USABLE RESULTS WERE OBTAINED FROM APPROXIMATELY 1,800. WITHIN THE LIMITS OF THE DATA IT WAS CONCLUDED THAT MANY OF THE CHANGES ATTRIBUTED TO THE "COLLEGIATE EXPERIENCE" MAY BE NO MORE THAN DEVELOPMENTAL CHANGES. (TC)

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The Psychological Impact of the Public Two-Year College on Certain Non-intellectual Functions

by

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CHAPTER I

INTRODUCTION

Problem

The principal problem of this study was to determine if there are significant changes in selected personality traits, ideologies, and values of students who attend a public junior college. An attempt was also made to measure to what extent such changes could be attributed to the college experience as such. Certain additional minor problems developed and were explored during the course of the investigation.

The major theses of the present study, stated as null hypotheses, are as follows:

1. Students attending a public junior college for two years do not change significantly in (a) personality traits, (b) ideology, or (c) values during that time.
2. Students attending a public junior college for varying periods of time (from 0 to 4 semesters) do not show changes in ideology, personality traits, or values which are significantly related to the time spent in attendance at college.

Related Research

People attending college change in many ways. Some of these changes result from the specific collegiate experiences while other changes are the consequences of maturation and the inevitable extra-collegiate experiences common to the culture.

The avowed aims of the college relate primarily to the more purely intellectual functions of the individual. The collegiate program concerns itself principally with the students' acquisition of a body of knowledge and a set of skills. The inculcation of information and skills is the direct goal of the educational process. Among the incidental and indirect consequences of formal collegiate education are changes in personality traits, ethical and moral characteristics, attitudes and values. Many educators would claim that these less purely intellectual outcomes of formal education are its real goals and that the inculcation of knowledge and the acquiring of skills is only the means of attaining the ethical and moral outcomes.

Almost every list of educational goals includes along with others the development of social and political sensitivities as well as moral and ethical character, and still, outside of a limited number of institutions, no specific courses or course content is designed to inculcate these things. For the most part, changes in attitudes, values, character, and personality are considered to be the indirect consequences of activities directed primarily at quite different things.

Just as the "ability to think," as an educational outcome, is thought to result from the total educational process, so attitudinal and other non-intellectual changes are similarly thought to be incidental products of activities the immediate goal of which is something quite different.

No one knows specifically how to "teach people to think," nor do we know how to systematically change attitudes, feelings, values and personality. We do know how to acquire information and skills and so we direct our efforts primarily in these directions and expect that the more non-intellectual outcome will be incidentally attained.

In the light of the predominant preoccupation of formal education with knowledge and skill, it is not surprising that psychological and educational research has been so largely concerned with these educational outcomes. However, interest in the non-intellectual educational outcomes of a collegiate experience seems to be increasing. With the development of instruments for the measurement of personality traits, interests, and attitudes in the late twenties and early thirties, a fairly large number of research studies concerned with changes in these areas began to appear. Murphy and Murphy (1931) and Murphy, Murphy, and Newcomb (1937) published comprehensive reviews of the studies published up to these dates. The studies reported in these reviews dealt largely with rather specific attitudes (attitudes toward war, treatment of animals, church, prohibition, birth-control). These research studies measured the effects of rather specific and limited types of experiences (special lectures, movies, courses, reading material); the time periods covered were relatively short and few, if any, adequate control or comparison groups were used. These studies, as well as similar, but more recent ones, indicate that such things as course content, books or articles read, and movies seen do change attitudes in the expected directions.

The first extensive study of the effects of a total four-year collegiate experience on non-intellectual functions seems to have been that of Newcomb (1943, 1948). From a comparison of

Bennington College students as freshmen and as seniors, he concluded that the college experience had produced a shift from political and economic conservatism to a more "liberal" position. Since no control or comparison groups were used, it was, of course, impossible to determine how much of this change was the result of the educational experience as such and how much of it resulted from maturational processes and cultural changes that occurred during this four-year period. The possibility that the early 1940's may have constituted a period of rapid attitudinal and ideological change in the United States and that the students' change may only have reflected changes taking place in all segments of American culture cannot be ruled out.

Some recent longitudinal studies give support to this possibility. Plant (1962) has shown that comparison groups, not in college, show changes in attitudes and ideology in the same direction although not as large as those made by students in college. His results indicate that changes such as Newcomb attributed to a college education also take place in non-collegiate groups of people. Plant suggests that college may simply accelerate a change going on in the general population.

Dressel and Mayhew (1954), in their general education studies, investigated certain personality changes associated with a college experience. Using the Inventory of Beliefs, an instrument devised specifically for use in their study, they found a decrease in "authoritarianism" over a one-year period in eleven out of thirteen colleges studied.

Another large-scale study of personality changes associated with college training was that of Sanford and his associates (1955, 1962) carried out at Vassar College. This study utilized a wide variety of tests and interviews and was more concerned with the nature of possible causes of the changes and the processes involved in these changes than in the extent of these modifications. The research at Vassar emphasized such personality characteristics as "intellectual functioning and achievement, authoritarianism and its opposite, masculinity-femininity and psychological health" (Sanford, 1955, 1962). Seniors as compared with freshmen scored significantly higher in Developmental Status, Social Maturity, and Impulse Expression. Similarly the seniors were less authoritarian and less ethnocentric than were freshmen.

When three of the Vassar scales - Social Maturity, Impulse Expression, and Developmental Status - were administered to the students in a variety of women's colleges, including a negro college in the South, a Catholic college in Canada, and an Eastern women's college which was judged to be quite different from Vassar, comparable changes in test scores from the freshman to the senior years were obtained (Sanford, 1962).

A series of studies is currently under way at the Center for the Study of Higher Education at the University of California which is designed to investigate personality changes in students attending several different kinds of colleges and universities (Sanford, 1962; McConnell and Heist, 1959).

The current research interest in the college impact question is indicated by the large number of studies recently completed or still in progress. In private, liberal arts colleges, impact research has been completed or is under way at Amherst College, Antioch College, Bennington College, Harvard University (three different studies), Reed College, Sarah Lawrence College, Stanford University, Swarthmore, Vassar College and Yale University. In public colleges, impact research has been completed or is in progress at Michigan State University, San Jose State College, and at San Francisco State College. In private, religiously controlled colleges, similar research is in progress at Austin College (Protestant) and has recently been completed at the University of Santa Clara (Roman Catholic), and the same kind of research is under way in some twenty medical colleges which constitute the American Medical Colleges Association. With respect to this apparent diversity of collegiate settings in which impact research is in progress, Jacob in the summary of his review of studies (1959, p. 130), indicates that . . . . "A basic short-coming of this study is its failure to include adequate information concerning several important types of institutions . . . ." It is our conviction that one quite important type of collegiate institution which has been completely overlooked in the impact research is the public, junior college.

At the second major research conference on college influences on personality (held by the Social Science Research Council's Committee on Personality Development in Youth, March 1959), there were 51 participants from 31 institutions or other agencies interested in personality development during the college years (Morrisett, 1959). Not one of these participants was from a public, two-year college nor planning an impact study in such a setting. The present study focuses on the impact of the public, two-year college and thereby provides information on one more important type of collegiate institution.

The public, two-year college is an exceedingly important part of higher education in the United States and particularly in the state of California. The public junior colleges in California now enroll more full-time students than do the California State Colleges and more full-time students than does the University of California system (Simpson, 1959). It has been estimated that approximately half of the recent graduates of the University and State College systems of California have obtained part of their collegiate instruction in a public two-year college.

In light of the magnitude of the junior college role in higher education in California alone, impact research in this type of collegiate setting seems necessary to fully understand what the effect of various kinds of collegiate experience is having on students. It is the primary purpose of the present study to provide this necessary information.

Some comprehensive reviews and critiques of the impact of collegiate experience on students have also appeared in recent years. The first and best-known of these was a rather uncritical review of published and unpublished studies in this field by Jacob (1957). Jacob concluded that no significant changes in belief, attitudes, opinions and personality traits (all values in Jacob's frame-of-reference) take place as a consequence of the typical collegiate experience. In addition he claimed that no significant changes in these areas could be attributed to any particular educational program or curriculum, instructional method or technique, instructor characteristic or educational materials. He also indicated that the main effect of higher education is an increased conformity to a generally accepted body of standards and attitudes. He claims that there is a greater homogeneity of beliefs, attitudes, and value systems among college students at the end of their four years in college than there was when they began.

Jacob's conclusions have been criticized, and to a considerable degree, questioned by Marquis (1955), Riesman (1958), Webster (1956, 1958, 1962) and Plant (1960b). These people have been critical of the breadth and adequacy of his research studies, his overgeneralization from limited data and the inadequacy of his statistical analyses.

A second briefer survey and report of some new data on the impact of the college on the student has been published by Freedman (1960). He reports significant increases in "psychological maturity," tolerance, liberality of religious beliefs, and acceptance of intellectual values over the four years of college. His studies involved the testing and re-testing of the same subjects as well as the conducting of intensive clinical interviews of selected groups of students. While Freedman's main study made use of Vassar students, test-retest data from other women's colleges showed the same general trends.

The most recent survey of the impact of the college on its students is found in Sanford's The American College (1962). In contrast with Jacob (1957), Sanford claims that the evidence indicates that students in college do show significant changes in the direction of greater liberalism and sophistication in their political, social, and religious outlooks. There is also evidence of broadening interests as well as changes in particular attitudes and values during the four years in college (Webster, Freedman, and Heist, 1962).

The Hazen Foundation, which sponsored the original Jacob (1957) report on Changing Values in College has also published two subsequent books dealing with certain issues raised by the publication of the original volume. One of these two books examined the meaning of "values" (Smith, 1958), while the other dealt with the methodology of the studies reviewed and summarized by Jacob (Barton, 1959). The latter study discusses some research design problems which are pertinent to our study.

According to Barton, studies of the effects of college education fall into four main types of design:

1. After-only comparisons of exposed and unexposed persons
2. Before-and-after comparisons of exposed group only
3. Comparison of groups at different stages of exposure
4. Before-and-after comparisons of exposed and unexposed groups.

The present study used Barton's design number 4 as listed above.

Barton has indicated the methodological limitations of each of these designs as follows:

(1) Differences found in after-only comparisons of exposed

and unexposed persons may be due to:

   a. The two groups being already different before exposure (the family as well as socio-economic backgrounds of people who go to college are different from those of people who do not attend college);

   b. The after-college experiences of the two groups influencing the test performances where the "after" measurements are made some time following the collegiate experience.

(2) Changes in the before-and-after studies of exposed people only may be due to:

   a. The observed changes reflecting motivational changes in the subject;

   b. General cultural or subcultural changes taking place either in the general population or in the specific segment of the population from which the subjects are drawn.

(3) Difference in comparison groups at different stages of exposure may be due to:

   a. Changes in the composition of the groups due to transfer and drop-out;

   b. Changes due to the same factors listed above (2a and b).

(4) Differences in the before-and-after performances of exposed and control groups may result from:

a. Uncontrolled factors related to the self-selection of student involved in studies of this sort. We really have comparison rather than control groups in studies involving this design since the fact is that people, to some degree, select themselves to go or not to go to college, to stay in or drop out of school. We never have the basic experimental model of equated or controlled randomized groups with which to work.

CHAPTER II

PROCEDURE

General Methodology

The methodology used in the present study was essentially the fourth design listed by Barton (1959). Barton describes this technique as a "before-and-after comparison of exposed and control groups." As indicated earlier, "control groups" could more accurately be called "comparison groups" since the groups were neither experimentally equated nor systematically randomized. The members of the various groups were primarily self-selected and this constitutes a contaminating factor of unknown magnitude.

In essence, some 4,500 prospective or newly enrolled, first-year, junior college students were administered a battery of tests either prior to or soon after matriculation in one of the six two-year colleges participating in the study. As many as possible of the 4,500 were retested with the same battery of tests approximately two years later. Changes in the test-retest scores of these subjects were related to the time spent in school. Various other analyses of the data were also made. These analyses will be described later.

Participating Junior Colleges

Six public junior colleges participated in the study. No particular rationale was used in selecting these schools. Five of the schools were selected because of their availability and proximity to the institution sponsoring the research project. The sixth college was included because one of the officials of the school volunteered to participate and was partially responsible for the initiation of the project. All of the six schools first contacted agreed to participate, but one later withdrew because their own institutional prematriculation test battery was so extensive that the students would be required to return for a second day of testing if the tests required by the research project were also administered. Another school from the same general area and of approximately the same size of student body was added to maintain the original number.

Measuring Instruments Used

The significance of a research study is necessarily limited by the reliability and validity of the measuring instruments used. Unfortunately, there are no generally accepted tests, or battery of tests of demonstrated high validity for use in the general personality, ideology, and attitude areas. A large number of tests have been devised and many more are continually being constructed for particular purposes, often for particular research studies. Since the scope of this study did not warrant the construction of new measuring devices, three tests were selected largely in terms of their availability, reliability, validity, and use in other comparable studies.

The three measuring instruments selected for use were the five selected scales of the California Psychological Inventory (C.P.I.), the Rokeach Dogmatism Scale: Form E (D Scale), and the Allport-Vernon-Lindzey Study of Values: 1960 Edition (A-V-L).

The California Psychological Inventory: (C.P.I.)

The California Psychological Inventory (hereinafter referred to as the C.P.I.) assesses personality by means of eighteen subscales grouped into four broad categories. The test is of the self-inventory type and consists of 480 items, each of which is answered in terms of a true-false dichotomy.

It was decided to use five instead of all eighteen scales in order to reduce the time required to take the tests. The scales used were selected on the basis of: (a) having the highest loadings for the five factors as identified by eight factor analytic studies (Hicks, 1960), and (b) having at least three validation studies each (Gough, 1957). The five scales selected on these bases were the Sociability (Sy) scale, the Self-Control (Sc) scale, the Achievement Via Independence (Ai) scale, the Intellectual Efficiency (Ie) scale, and the Responsibility (Re) scale.

Based upon the validation studies reported in the test manual for the C.P.I. (Gough, 1957), high scorers on the Sociability (Sy) scale are characterized as "outgoing, enterprising, and ingenious," as being "competitive and forward," and as "original and fluent in thought," whereas low scorers tend to be "awkward, conventional, quiet, submissive, and unassuming," "detached and passive in attitude", and "suggestible and overly influenced by others' reactions and opinions."

Persons scoring high on the Self-Control (Sc) scale are characterized as "calm, patient, practical, slow, self-denying, inhibited, thoughtful, and deliberate," as being "strict and thorough in their own work and in their expectations for others," and as being "honest and conscientious." Low scorers are said to be "impulsive, shrewd, excitable, irritable, self-centered, and uninhibited;" they are "agressive and assertive, and over-emphasize personal pleasure and self-gain."

High scorers on the Achievement Via Independence (Ai) scale are seen as "mature, forceful, strong, dominant, demanding, and foresighted," as being "independent and self-reliant," and as "having superior intellectual ability and judgement." Low scorers are seen as "inhibited, anxious, cautious, dissatisfied, dull, and wary," as being "submissive and compliant before authority," and as "lacking in self-insight and self-understanding."

Persons scoring high on the Intellectual Efficiency (Ie) scale are seen as "efficient, clear-thinking, capable, intelligent, progressive, planful, thorough, and resourceful;" as being "alert and well-informed," and as "placing a high value on cognitive and intellectual matters." Low scorers are perceived as "cautious, confused, easy-going, defensive, shallow, and unambitious;" as being "conventional and stereotyped in thinking," and as "lacking in self-direction and self-discipline."

Persons scoring high on the Responsibility (Re) scale are described as "planful, responsible, thorough, progressive, capable, dignified, and independent;" as being "conscientious and dependable, resourceful and efficient;" and as being "alert to ethical and moral issues." Low scorers are seen as "immature, moody, lazy, awkward, changeable and disbelieving;" as being "influenced by personal bias and dogmatism;" and as "under-controlled and impulsive in behavior" (Gough, 1957).

As a check on the reliability of the five scales as reported by Gough, additional odd-even reliability coefficients were computed for random samples of 100 males and 100 females from our total sample. The values obtained, corrected for length of test by the Spearman-Brown formula, together with some of Gough's data are given in Table 1.

TABLE 1

Reliability Coefficients for Five Selected Scales of the C.P.I.

	Males					Females				
Source	Sy	Sc	Ai	Ie	Re	Sy	Sc	Ai	Ie	Re
Gough (1957), test retest, one year interval.	.68	.75	.63	.74	.65	.71	.68	.57	.77	.73
Present study, odd even, split half.	.77	.84	.78	.81	.81	.57	.82	.68	.67	.69

Table 1 shows the mean of the odd-even correlations to be higher than Gough's test-retest correlations. This is, of course, to be expected. These reliability coefficients, while not all high, are sufficient for group comparisons such as those involved in the current study.

Validity and cross-validity studies reported by Gough (1957) in which groups of individuals nominated or rated as either high or low in the various traits as descirbed show significant test score differences for each of the five scales used in this study. The data presented by Gough indicate that the scales have sufficient validity for our purposes.

The Rokeach Dogmatism Scale: Form E

The Dogmatism Scale: Form E (D Scale) was one of a series of measuring devices developed by Rokeach (1956, 1960) for the investigation of various aspects of belief systems. The D Scale was constructed, like the familiar California F Scale (Adorno, Frenkel-Brunswik, Levinson, and Sanford, 1950), to measure general authoritarianism, but the authoritarianism to be measured by the D Scale was not politically or socially oriented. The California F Scale measured authoritarianism of a "rightist" or "fascist" type whereas the D Scale was designed to study dogmatism, authoritarianism, or "closed-mindedness" of a more general sort. The characteristic for which Rokeach developed the D Scale could be either autocratic or democratic, "right" or "left," conservative or radical, theistic or atheistic in its orientation.

Rokeach and his associates (1960) have published a large number of studies which indicate that the D Scale does measure this more general type of dogmatism. These studies as well as others (Plant, 1960a), have shown that performance on the D Scale is less linked with anti-Semitism and ethnocentrism than was the older California F Scale. For example, Rokeach has shown that whereas Catholic and Communist groups differ markedly in their scores on the California F and E Scales (the E Scale measures ethnocentrism), they are essentially alike in their performance on his D Scale. Non-Catholic and non-Communist groups were lower than the Catholics but higher than the Communists on the F and E scales whereas on the D Scale they were lower (less dogmatic) than either the Communist or Catholic groups. Since Rokeach hypothesized that the Catholics would be more authoritarian and more ethnocentric than either the Communist or other comparison groups, that the Communist group would be less ethnocentric and less authoritarian than either of the other comparison groups, and that the Catholics and Communists would both be higher in general dogmatism than the other groups, the results supported his contention that the dogmatism measured by the D Scale was a more general factor relatively independent of a prejudicial and political frame-of-reference. Groups of individuals nominated by their peers as either highly closed-minded and dogmatic or open-minded and non-dogmatic were found to differ significantly in scores on the D Scale. Interested readers are referred to Rokeach's (1960) summary of the theoretical background of the development of the scale and additional validation studies. The reliability of the D Scale has been found to be satisfactory for studies such as the present one. Rokeach (1956) reports odd-even, split-half reliability coefficients ranging from .70 to .91. Odd-even, split-half reliabilities based on 800 cases were found by Plant, Minium, and Myers (1959) to be .84 for males and .85 for females. Test-retest scores yielded reliability coefficients of .56 for 172 male and .59 for 212 female subjects over a four-year period of time (Plant, 1962). To further check on these values, odd-even reliability coefficients were computed on a random sample of 100 males and 100 females from the samples of this study. Correlations of .79 and .84 were obtained on the male and female samples respectively. All of the split-half correlation coefficients referred to above were corrected for length by use of the Spearman-Brown formula.

The Allport, Vernon, and Lindzey Study of Values

This measuring device is probably the most widely used instrument for the study of values or dominant interest modes in personality. The 1960 form contains 45 items; 30 of these require dichotomous answers (agree or disagree; prefer a or b) while the other 15 items require a ranking of multiple-choice answers. The answers to these 45 items yield six scores which indicate the relative prominence of basic interests, motives, or "values" for the individual. The resulting profile of scores indicates the relative strength of each of the following for the subject: Theoretical, Economic, Aesthetic, Social, Political, and Religious motives. These six areas of value were originally based upon Spranger's (1928) typology of values.

The reported reliability of the scores from the A-V-L seems adequate for our purposes. The mean split-half reliability coefficient is .82 for the six scales; the test-retest reliability is reported to be .89 for a one-month interval, and .88 for a two-month test-retest interval (Allport, Vernon, and Lindzey, 1960). An item analysis shows a positive correlation for each item with the total score for its value, significant at the .01 level of confidence (Allport et al., 1960).

Surveys of the external validation studies of the A-V-L have been published by Cantril and Allport (1933), and by Duffey (1940). A more recent validation study indicates some validity in a follow-up longitudinal study covering a 5 to 15 year period (Mawardi, 1952). Newcomb's (1943) findings that Bennington College students showed changes in the expected direction, the Postman and Schneider (1951) study showing a correlation between value scores on the A-V-L and the reaction-time for the perception of value-related words, and the discovery that the profiles of married couples are similar (Schooley, 1936) provide incidental and indirect evidence of the validity of the measuring instrument for studies of this type. The fact that many previous studies similar to the present one have reported changes in A-V-L scores during attendance at college can also be taken as indirect evidence of the instrument's validity (Arsenian, 1943; Kelley, 1955; Burgemeister,1940; Spoerl, 1952; Whitely, 1938).

Subjects Tested in 1960

Due to the heterogeneous student population in the typical junior college, and because of probable difficulties involved in obtaining follow-up retest data on the large number of evening and part-time students, it was decided to use in this study only those subjects who either were, or declared their intentions to become, full-time regular students.

The three tests used in the study were administered either by, or under the supervision of, a research assistant at each of the six cooperating schools. The tests were administered either as part of the required prematriculation battery or they were given as soon as practicable after the start of school in the orientation classes or meetings in the fall of 1960. Including the test battery as a part of the prematriculation tests had the advantage of providing us with a larger number of individuals who intended to enter college, took the tests, and then did not attend any collegiate institution. Where the school authorities did not consider it feasible to require the tests to be taken prior to matriculation, they were administered soon after registration as a part of the "orientation" program. In three schools the test battery was administered before matriculation, and in the other three schools the battery was administered after matriculation. The tests were all scored at the sponsoring institution, and standard scoring procedures were followed throughout.

The numbers of subjects initially tested and for whom usable data were obtained from each of the six junior colleges, together with totals, are indicated in Table 2.

TABLE 2

Number of Subjects Tested in 1960 at the Six Colleges

	Colleges						
	A	B	C	D	E	F	Totals
Males	131	619	409	147	287	1,050	2,643
Females	61	496	223	125	257	701	1,863
Totals	192	1,115	632	272	544	1,751	4,506

Subjects Tested in 1962

In May of 1962, a packet of test materials was mailed either to the home or to the last permanent address available for each of the subjects for whom we had obtained complete test data in 1960. The test packet included a copy of each of the three tests (C.P.I., D Scale, and A-V-L), complete directions for taking each of the tests, a letter requesting participation and a prompt return of the tests when taken, and a stamped and addressed return envelope. Some 600 of the packets were eventually returned as undeliverable. A follow-up postal card was sent to all persons failing to respond to the initial request. The tests were returned to and scored by research assistants at the sponsoring institution. All of the tests were hand scored, and standard scoring procedures were used throughout.

As a result of the original mailing and the follow-up, responses were obtained from 1,713 of the original 4,506 subjects tested in 1960. Because 600 of the original 4,506 packets were returned as undeliverable, the total of those presumably having the opportunity to respond was 3,906. Using 3,906 as our base, we obtained responses from 46 per cent of the cases who presumably received the retest materials while 54 per cent failed to respond. The actual per cent of non-respondents is probably less than 54 per cent as many people other than the addressees undoubtedly received and failed to either return the materials or send them on to the intended subjects. Statistical comparisons of the 1960 status for those who responded vs. those who did not respond in 1962 were made to determine if there were systematic differences between respondents and non-respondents. The results of these comparisons are reported in the results chapter.

Originally the intention was to make interschool comparisons on the changes for each educational attainment group on each of the test variables. Ultimately, the key comparisons used to test the hypotheses of the study were made for groups of subjects combined across schools and into educational attainment or attendance groups. The decisions to combine groups of subjects were made on the basis of practical, empirical, and logical considerations.

During the two-year period of the study, subjects had the opportunity to complete four semesters of junior college enrollment. Actual collegiate enrollment varied for the 1962 respondents from 0 to 4 semesters. Simple tallies were made of the number of males and females at each of the six colleges who responded in 1962 and who completed 4, 3, 2, 1, or 0 semesters of junior college enrollment during the two years 1960 to 1962. Because some of the resulting tallies had either no cases or relatively few cases in given cells, educational attainment or attendance groups were combined. All results to be reported will be for six groups of subjects who have been combined into sex and educational attainment groups of 3 or 4 semesters, 1 or 2 semesters, or 0 semesters.

To determine if it was desirable and practical to combine groups across colleges, empirical tests of the significance of the differences between 1960 and 1962 mean differences were made for each test-retest variable for each sex and educational attainment group. An example of the procedure used follows: the analysis of variance of the mean differences 1960 to 1962 from variable 1 with mean differences from each of the six colleges was made for the respondent males completing 3 or 4 semesters of enrollment. In all, 76 analysis of variance problems of mean differences or mean gains were undertaken: six for each of the 12 test variables. The ranges of mean differences '60-'62, the ranges of the sigmas of the mean differences '60-'62, the F-ratios for the mean differences '60-'62 for all test variables for all subjects are found in Tables 30 through 35 in Appendix A. Eleven of the 76 analysis of variance problems yielded F-ratios significant at or beyond the .05 level of confidence indicating some statistically significant differences between colleges as measured by student characteristics.

Even though there were more significant differences than chance expectation, after inspection of the distribution of differences across the sex, variable, and educational attainment possibilities the decision was made to combine educational attainment groups across colleges. The relatively small numerical differences between the college groups with the same educational attainment also was a factor in the decision to combine groups across colleges. Inspection of the data in Tables 30 through 35 permits the interested reader to examine the magnitude of the differences obtained.

After the above analyses were made, and the decisions to combine data were made, all remaining comparisons relevant to the main purposes of this study were made for groups combined across colleges into somewhat combined educational attainment groups. Table 3 contains the numbers for whom usable data were obtained in the 1960 testing, the numbers of respondents and non-respondents from the 1962 testing, and the net usable cases distributed by sex and educational attainment or attendance.

TABLE 3

1962 Non-respondents, Respondents, and Usable Cases Distributed by Amount of Education 1960 to 1962

Semesters Enrolled	N	1962 Non-respondents	1962 Respondents	Usable Cases
		Males		
3 or 4	987	521	466	452
1 or 2	1,101	734	367	362
0	555	389	166	133
Totals	2,643	1,644	999	947
		Females		
3 or 4	597	255	343	339
1 or 2	721	458	263	255
0	545	357	188	172
Totals	1,863	1,070	794	766

The difference in frequencies between the 1962 Respondents column and the Usable Cases column results from the exclusion of 1962 respondents who declared themselves to be enrolled or to have been enrolled in another collegiate institution during the time period of the study, or because of either an insufficient response or an inability to properly identify a subject. In certain of the group comparisons to be reported, the number of cases differs slightly from comparison to comparison due to the decision to retain those subjects for whom response was insufficient on one test variable but not on the others.

Restatement of Study Hypotheses

In light of having defined personality characteristics in terms of five scales of the California Psychological Inventory, having defined ideology in terms of the Rokeach D-Scale, having defined values in terms of the Study of Values (A-V-L), and the widespread observation that there are significant sex differences on these measures, the generally stated hypotheses need to be restated. The restated hypotheses take account of specific test variables, sex, and educational attainment during the two-year period of this study. For the current study, the restated hypotheses in null hypothesis form are:

Hypothesis 1 : Persy. Males enrolled in junior college for 3 or 4 semesters of a two-year period do not change significantly in sociability, self-control, achievement via independence, intellectual efficiency or responsibility (as measured by the California Psychological Inventory) over the two-year period.

Hypothesis 2 : Persy. Females enrolled in junior college for 3 or 4 semesters of a two-year period do not change significantly in sociability, self-control, achievement via independence, intellectual efficiency or responsbility (as measured by the California Psychological Inventory) over the two-year period.

Hypothesis 3 Persy. : Males enrolled in junior college for 1 or 2 semesters of a two-year period do not change significantly in sociability, self-control, achievement via independence, intellectual efficiency or responsibility (as measured by the California Psychological Inventory) over the two-year period.

Hypothesis 4 Persy. : Females enrolled in junior college for 1 or 2 semesters of a two-year period do not change significantly in sociability, self-control, achievement via independence, intellectual efficiency or responsibility(as measured by the California Psychological Inventory) over the two-year period.

Hypothesis 5 Persy. : Males enrolled in junior college for no semesters of a two-year period do not change significantly in sociability, self-control, achievement via independence, intellectual efficiency, or responsibility (as measured by the California Psychological Inventory) over the two-year period.

Hypothesis 6 Persy. : Females enrolled in junior college for no semesters of a two-year period do not change significantly in sociability, self-control, achievement via independence, intellectual efficiency, or responsibility (as measured by the California Psychological Inventory) over the two-year period.

Hypothesis 7 Ideology : Males enrolled in junior college for 3 or 4 semesters of a two-year period do not change significantly in dogmatism (as measured by the Rokeach Dogmatism Scale) over the two-year period.

Hypothesis 8 Ideology : Females enrolled in junior college for 3 or 4 semesters of a two-year period do not change significantly in dogmatism (as measured by the Rokeach Dogmatism Scale) over the two-year period.

Hypothesis 9 Ideology : Males enrolled in junior college for 1 or 2 semesters of a two-year period do not change significantly in dogmatism (as measured by the Rokeach Dogmatism Scale) over the two-year period.

Hypothesis 10 Ideology : Females enrolled in junior college for 1 or 2 semesters of a two-year period do not change significantly in dogmatism (as measured by the Rokeach Dogmatism Scale) over the two-year period.

Hypothesis 11:
Ideology
Males enrolled in junior college for no semesters of a two-year period do not change significantly in dogmatism (as measured by the Rokeach Dogmatism Scale) over the two-year period.

Hypothesis 12:
Ideology
Females enrolled in junior college for no semesters of a two-year period do not change significantly in dogmatism (as measured by the Rokeach Dogmatism Scale) over the two-year period.

Hypothesis 13:
Values
Males enrolled in junior college for 3 or 4 semesters of a two-year period do not change significantly in theoretical, economic, aesthetic, social, political, or religious values (as measured by the Allport, et al. Study of Values) over the two-year period.

Hypothesis 14:
Values
Females enrolled in junior college for 3 or 4 semesters of a two-year period do not change significantly in theoretical, economic, aesthetic, social, political, or religious values (as measured by the Allport, et al. Study of Values) over the two-year period.

Hypothesis 15:
Values
Males enrolled in junior college for 1 or 2 semesters of a two-year period do not change significantly in theoretical, economic, aesthetic, social, political, or religious values (as measured by the Allport, et al. Study of Values) over the two-year period.

Hypothesis 16:
Values
Females enrolled in junior college for 1 or 2 semesters of a two-year period do not change significantly in theoretical, economic, aesthetic, social, political, or religious values (as measured by the Allport, et al. Study of Values) over the two-year period.

Hypothesis 17:
Values
Males enrolled in junior college for no semesters of a two-year period do not change significantly in theoretical, economic, aesthetic, social, political, or religious values (as measured by the Allport, et al. Study of Values) over the two-year period.

Hypothesis 18:
Values
Females enrolled in junior college for no semesters of a two-year period do not change significantly in theoretical, economic, aesthetic, social, political, or religious values (as measured by the Allport, et al. Study of Values) over the two-year period.

Data Processing and Statistical Techniques Employed

All 1960 test results in addition to complete identification data for the original 4,506 subjects were punched into standard IBM cards. All 1962 test results and educational attainment data were punched into the same cards for the appropriate cases. All analyses of test data were carried out in our local computer center under the direction of Dr. Robert Clarke and his assistant, Mr. Alan Pratt.

Conventional statistical procedures were used for testing the restated hypotheses and other analyses reported in the results chapter. For the hypotheses, two-tailed tests were used because the hypotheses do not include a prediction of direction of change.

CHAPTER III

RESULTS AND DISCUSSION

The results for the study will be presented in the order of the restated hypotheses. The hypotheses and results reported for each will be for changes in personality traits, changes in ideology, and changes in values with summary tables and remarks following the report of results for each set of variables.

Part A: Changes in personality traits

In order to test hypotheses 1 and 2 (that males and females enrolled in junior college for 3 or 4 semesters of a two-year period do not change significantly in measured personality traits over the two-year period), mean 1960 scores on the five scales of the California Psychological Inventory were compared with mean 1962 scores on the same scales for 452 males and 339 females enrolled for 3 or 4 semesters over the two-year period. Tests of the significance of the differences for correlated means were used to test these hypotheses. Tables 4 and 5 contain the relevant data for these comparisons.

TABLE 4

Differences in C.P.I. Scale Means 1960-1962 for 452 Males who Were Enrolled for 3 or 4 Semesters 1960 to 1962

Scale Variable	Mean 1960	Sigma 1960	Mean 1962	Sigma 1962	r 60-62	t	P
Sociability	23.30	5.50	24.42	5.50	.68	5.50	.01
Self Control	25.79	7.86	27.30	8.22	.65	4.81	.01
Ach via Indep	17.49	4.40	20.04	4.49	.62	14.02	.01
Intell Effic	34.85	6.24	37.74	5.62	.58	11.36	.01
Responsibil	28.68	4.88	30.10	4.90	.61	7.04	.01

TABLE 5

Differences in C.P.I. Scale Means 1960-1962 for 339 Females who Were Enrolled for 3 or 4 Semesters 1960 to 1962

Scale Variable	Mean 1960	Sigma 1960	Mean 1962	Sigma 1962	r 60-62	t	P
Sociability	23.36	5.21	24.33	5.34	.68	4.24	.01
Self Control	28.02	7.98	28.85	7.87	.61	2.21	.05
Ach Via Indep	18.27	3.96	20.63	3.99	.58	12.01	.01
Intell Effic	36.11	5.65	38.47	5.79	.55	8.08	.01
Responsibil	31.47	4.32	32.22	4.28	.60	3.58	.01

As can readily be seen in Tables 4 and 5, the males and the females enrolled for three or four semesters during the two-year period change significantly on all scale variables. This change is, without exception, in the direction of increased sociability, self-control, achievement via independence, intellectual efficiency, and responsibility. Hypotheses 1 and 2 are rejected; there are significant changes in measured personality characteristics associated with being enrolled in junior college for three or four semesters during a two-year period.

In order to test Hypotheses 3 and 4 (that males and females enrolled in junior college for 1 or 2 semesters of a two-year period do not change significantly in measured personality traits over the two-year period), mean 1960 scores on the five scales of the C.P.I. were compared with mean 1962 scores on the same scales for 362 males and 255 females enrolled for 1 or 2 semesters over the two-year period. Tests of the significance of differences for correlated means were used to test these hypotheses. Tables 6 and 7 contain the relevant data for these comparisons.

TABLE 6

Differences in C.P.I. Scale Means 1960-1962 for 362 Males who Were Enrolled for 1 or 2 Semesters 1960 to 1962

Scale Variable	Mean 1960	Sigma 1960	Mean 1962	Sigma 1962	r 60-62	t	P
Sociability	23.31	5.03	24.54	4.76	.56	5.09	.01
Self Control	24.95	7.84	26.37	8.04	.55	3.63	.01
Ach Via Indep	16.54	4.52	18.20	4.48	.57	7.57	.01
Intell Effic	34.39	6.12	36.77	5.59	.51	7.81	.01
Responsibil	27.60	5.38	28.94	4.85	.60	5.60	.01

TABLE 7

Differences in C.P.I. Scale Means 1960-1962 for 255 Females who Were Enrolled for 1 or 2 Semesters 1960 to 1962

Scale Variable	Mean 1960	Sigma 1960	Mean 1962	Sigma 1962	r 60-62	t	P
Sociability	23.21	5.55	23.78	5.71	.66	1.98	.05
Self Control	27.22	8.08	28.66	8.03	.61	3.24	.01
Ach Via Indep	18.08	4.09	19.67	3.98	.61	7.21	.01
Intell Effic	35.06	6.24	37.25	5.46	.64	7.02	.01
Responsibil	30.56	4.36	31.40	4.51	.54	3.19	.01

The t-ratios and probability values for the t-ratios in Tables 6 and 7 indicate that males and females enrolled for one or two semesters during the two-year period of this study change significantly on all of the scale variables. This change is, without exception, in the direction of increased sociability, self-control, achievement via independence, intellectual efficiency, and responsibility. Hypotheses 3 and 4 are rejected; there are significant changes in measured personality characteristics associated with being enrolled in junior college for one or two semesters during a two-year period.

To test Hypotheses 5 and 6 (that males and females enrolled in junior college for no semesters of a two-year period do not change significantly in measured personality traits over the two-year period), mean 1960 scores on the five scales of the C.P.I. were compared with mean 1962 scores on the same scales for 133 males and 172 females who were not enrolled in college at all over the two-year period. Tests of the significance of differences for correlated means were used to test these hypotheses. Tables 8 and 9 contain the necessary data for these comparisons.

TABLE 8

Differences in C.P.I. Scale Means 1960-1962 for 133 Males who Were Enrolled for No Semesters 1960 to 1962

Scale Variable	Mean 1960	Sigma 1960	Mean 1962	Sigma 1962	r 60-62	t	P
Sociability	23.53	5.10	24.55	5.33	.48	2.23	.05
Self Control	24.21	8.36	25.28	7.55	.68	1.94	ns
Ach Via Indep	16.65	5.14	18.81	4.43	.66	6.25	.01
Intell Effic	34.05	6.64	36.38	6.69	.44	3.82	.01
Responsibil	28.18	5.47	29.28	5.57	.55	2.43	.05

TABLE 9

Differences in C.P.I. Scale Means 1960-1962 for 172 Females who Were Enrolled for No Semesters 1960 to 1962

Scale Variable	Mean 1960	Sigma 1960	Mean 1962	Sigma 1962	r 60-62	t	P
Sociability	23.37	5.49	23.55	5.55	.70	.55	ns
Self Control	27.50	8.73	28.09	7.82	.65	1.10	ns
Ach Via Indep	17.59	4.44	19.12	4.01	.66	5.78	.01
Intell Effic	35.24	5.95	36.43	6.02	.55	2.75	.01
Responsibil	30.26	4.95	31.45	5.11	.53	3.20	.01

For the males with no semesters of college enrollment during the two-year period, there were four changes out of the five which reached acceptable levels of statistical significance. In addition, all changes were in the same direction. We have rejected hypothesis number five; there are significant changes in measured personality characteristics associated with no college enrollment over the two-year period of this study. For the females with no semesters of college enrollment during the two-year period, there were three changes out of the five which reached acceptable levels of statistical significance, and all changes were in the same direction. We have tentatively rejected hypothesis six; in light of three significant changes on the C.P.I. variables and all five in the same direction, there are changes in measured personality characteristics for the female non-college subjects.

To facilitate interpretation of the findings for the measured personality variables, a summary table has been prepared indicating the magnitude of the mean differences for each C.P.I. scale for the study subjects categorized by sex and level of educational attainment. The table also includes a summary of the direction of the changes and an indication of the significance level for the correlated t tests. Table 10 is the summary table.

TABLE 10

Summary of the Amount, Direction and Significance Level of Changes on the C.P.I. Scales 1960 - 1962 for All Subjects Categorized by Sex and Educational Attainment from 1960 to 1962

Males

	3-4 Semesters		1-2 Semesters		0 Semesters	
Scale Variable	Mean Diff.	P	Mean Diff.	P	Mean Diff.	P
Sociability	+1.12	.01	+1.23	.01	+1.02	.05
Self Control	+1.51	.01	+1.42	.01	+1.07	ns
Ach Via Indep	+2.55	.01	+1.66	.01	+2.16	.01
Intell Effic	+2.89	.01	+2.38	.01	+2.33	.01
Responsibility	+1.42	.01	+1.34	.01	+1.10	.05

Females

	3-4 Semesters		1-2 Semesters		0 Semesters	
Scale Variable	Mean Diff.	P	Mean Diff.	P	Mean Diff.	P
Sociability	+ .97	.01	+ .57	.05	+ .18	ns
Self Control	+ .83	.05	+1.44	.01	+ .59	ns
Ach Via Indep	+2.36	.01	+1.59	.01	+1.53	.01
Intell Effic	+2.36	.01	+2.19	.01	+1.19	.01
Responsibility	+ .75	.01	+ .84	.01	+1.19	.01

It will be noted in Table 10 that there have been thirty 1960 to 1962 comparisons made, and that 27 of the 30 reach acceptable levels of statistical significance. In addition, all 30 comparisons yield mean differences in the same direction. All of the analyses from the five scales of the C.P.I. strongly indicate that, for our subjects, there is a general personality development under way apart from the amount of educational experience of the groups of subjects. The evidence indicates that this change takes place in all sex and educational attainment groups.

Even though the changes in C.P.I. scores reach acceptable levels of statistical significance, the question arises as to whether or not the reported changes are of any practical significance. There is no agreed upon procedure for answering this question. If one accepts an arbitrary criterion similar to the one proposed below, certain additional observations from the results reported are possible. It is here proposed that a mean difference approximately equal to one-half of the average standard deviation of the two means from which the mean difference has been obtained constitute a basis for asserting that a statistically significant difference is also of some practical significance. Given such an arbitrary and demanding criterion, it follows that the changes on two of the five C.P.I. scales appear to have some practical significance. On the Achievement via Independence and the Intellectual Efficiency scales, the mean differences for the six different groups are approximately equal to one-half of the average standard deviations of the means from which the differences were derived. The mean differences relative to the average standard deviations are greatest for the 3 or 4 semester males and females on the Ai and Ie scales. We have interpreted this to indicate that the collegiate experience has something of a "facilitating" effect upon a personality change under way in college aspiring youth apart from their actual collegiate experience.

The three following additional types of analyses of the C.P.I. data were undertaken to make more explicit some of the characteristics which may have influenced the results reported to this point.

(a). An analysis was made of the 1960 status of those who responded in 1962 but who differed in educational attainment during the two-year period of the study.

(b). An analysis was made of the 1960 status of 1962 respondents compared with that of 1962 non-respondents categorized into educational attainment groups.

(c). An analysis was made of sex differences as of 1960, as of 1962, and for mean differences '60 to '62 for those subjects completing 3 or 4 semesters of college enrollment during the two years.

To determine the initial status of those who responded in 1962 but who differed in educational attainment during the two-year period following the initial testing, analyses of variance for the 1960 means were undertaken for males and females on each of the five C.P.I. scales. As an example of the procedure, the analysis of variance was computed for the three 1960 means on the Sociability scale for the 452 males enrolled 3 or 4 semesters, the 362 males enrolled 1 or 2 semesters, and the 133 males enrolled for no semesters 1960 to 1962. Ten analysis of variance problems resulted: one for each of the C.P.I. scale variables for each sex. Three of the obtained F-Ratios were statistically significant at or beyond the .05 level:

two for males and one for females. For males, the 3 or 4 semester group had the highest mean in 1960 on the Ai and Re scales with the 1 or 2 semester males having the lowest mean on both. The range of differences between the three means were .95 and 1.08 respectively for the Ai and Re comparisons. We concluded that, although these two scales showed statistically significant differences in 1960 status for the 1962 respondent males differing in educational experience, the differences were small enough to warrant the conclusion of similarity of initial status. The same interpretation was made for the one scale for which the analysis of variance of 1960 C.P.I. means yielded a statistically significant difference for females.

Perhaps it is the case that persons who participate in a study like the present one are more likely to change on the study variables over time irrespective of educational experience than will those who elect not to participate. There is no direct test of this proposition because of the lack of 1962 data for the non-respondents. However, the opportunity does exist to study whether or not 1962 respondents were different from 1962 non-respondents in terms of 1960 scale performance, and such analyses were made. If the 1962 respondents were quite different from the 1962 non-respondents in terms of 1960 status on the C.P.I. scales, then generalizations from the present study would need to be limited to persons willing to participate. Table 11 contains the relevant data for all male respondents compared with all male non-respondents of 1962 categorized by educational attainment during the two-year period of this study. Table 12 contains the same data for female respondents and non-respondents of 1962.

Seven of the fifteen comparisons between 1962 respondent male groups and 1962 non-respondent male groups are statistically significant. The seven significant uncorrelated t-tests for differences between 1960 means for respondents vs. non-respondents of 1962 yield higher C.P.I. means for the respondents. The only educational category group for which there were no statistically significant differences in 1960 means on the C.P.I. scales was the "no semester" group. Generalizations for this "no semester" group are not limited by initial differences between those who participated and those who did not participate. Whether or not the obtained statistically significant differences limit the generalizations for the other two groups of males depends upon an interpretation of the importance of the magnitude of the scale difference. Using the arbitrary criterion proposed earlier for determining a practical difference, none of the obtained statistical differences is of practical significance. Inspection of the mean differences column and of the standard deviation columns in Table 11 permits the reader to decide whether or not our interpretation of essential similarity in 1960 for 1962 respondents and non-respondents is warranted. As is indicated in Table 12, only one of the fifteen comparisons between 1962 respondent female groups and 1962 non-respondent female groups is statistically significant. We do not feel that this limits the generalizations for our female subjects, and this is particularly true for the two key comparison groups: the 3 or 4 semester and "no semester" groups.

TABLE 11

1960 C.P.I. Scale Means for all Male 1962 Respondents Compared with All Male 1962 Non-respondents Categorized by Semesters of Enrollment 1960 to 1962

		1962 Respondents			1962 Non-respondents					
Scale	Sem.60-62 Enrolled	N	Mean 1960	Sigma 1960	N	Mean 1960	Sigma 1960	Mean Diff	t	P
Sy	3 or 4	452	23.30	5.50	521	23.87	4.99	-.57	-1.71	ns
	1 or 2	362	23.31	5.03	734	23.75	5.09	-.44	-1.17	ns
	0	133	23.53	5.10	389	23.49	5.41	.10	.04	ns
Sc	3 or 4	452	25.79	7.86	521	24.34	7.97	1.45	2.88	.01
	1 or 2	362	24.95	7.84	734	24.03	7.63	.92	2.01	.05
	0	133	24.21	8.36	389	24.43	7.96	-.22	-.27	ns
Ai	3 or 4	452	17.49	4.40	521	16.07	4.48	1.42	4.94	.01
	1 or 2	362	16.54	4.52	734	15.82	4.47	.72	2.67	.01
	0	133	16.65	5.14	389	16.21	4.05	.44	1.05	ns
Ie	3 or 4	452	34.85	6.24	521	34.07	6.40	1.89	.78	ns
	1 or 2	362	34.39	6.12	734	33.42	6.35	.97	2.67	.01
	0	133	34.05	6.64	389	33.80	6.30	.25	.40	ns
Re	3 or 4	452	28.68	4.88	521	27.32	5.12	1.36	4.23	.01
	1 or 2	362	27.60	5.38	734	26.59	5.25	1.01	3.24	.01
	0	133	28.18	5.47	389	27.24	5.01	.94	1.78	ns

TABLE 12

1960 C.P.I. Scale Means for all Female 1962 Respondents Compared With All Female 1962 Non-respondents Categorized by Semesters of Enrollment 1960 to 1962

		1962 Respondents			1962 Non-respondents					
Scale	Sem.60-62 Enrolled	N	Mean 1960	Sigma 1960	N	Mean 1960	Sigma 1960	Mean Diff	t	P
Sy	3 or 4	339	23.36	5.21	255	23.43	5.28	-.07	-.10	ns
	1 or 2	255	23.21	5.55	458	23.11	5.76	.10	.20	ns
	0	172	23.37	5.49	357	23.13	5.12	.14	.47	ns
Sc	3 or 4	339	28.02	7.98	255	28.25	7.71	-.23	-.37	ns
	1 or 2	255	27.22	8.08	458	27.09	7.79	.13	.20	ns
	0	172	27.50	8.73	357	27.30	8.25	.20	.35	ns
Ai	3 or 4	339	18.27	3.96	255	17.83	4.09	.44	1.28	ns
	1 or 2	255	18.08	4.09	458	17.05	4.40	1.03	3.04	.01
	0	172	17.59	4.44	357	16.97	4.20	.62	1.69	ns
Ie	3 or 4	339	36.11	5.65	255	35.76	5.68	.35	.74	ns
	1 or 2	255	35.06	6.24	458	34.27	6.01	.79	1.66	ns
	0	172	35.24	5.95	357	34.18	6.20	1.06	1.95	ns
Re	3 or 4	339	31.47	4.32	255	31.37	4.25	.10	.22	ns
	1 or 2	255	30.56	4.36	458	29.91	4.70	.65	1.80	ns
	0	172	30.26	4.95	357	30.05	4.89	.21	.49	ns

These respondent vs. non-respondent analyses of initial differences on the C.P.I. scale means place little restriction upon the overall study generalizations of this study.

A casual inspection of the 1960 means on the C.P.I. for the several educational attainment groups suggest that the mean scores for males are different from the means on the same variables for females. We have been interested in determining whether or not there were significant differences between the males and females on the 1960 C.P.I. variables, and if so, whether or not these differences existed after two years of educational attainment in a two-year period. There have been suggestions that colleges are primarily oriented toward males and the male role, and there is an implied hypothesis that females in such settings might become less feminine as a result of educational experience in college. It would follow from such an hypothesis that a two-year college experience might reduce or eliminate some measured sex differences.

Statistical comparisons of the differences between C.P.I. means for males and females have been computed for the 1960, 1962, and mean difference status for the 452 males and 339 females completing 3 or 4 semesters of college enrollment during the period 1960 to 1962. Tables 13 and 14 contain the information from these comparisons.

In 1960, the females who later finished 3 or 4 semesters of enrollment during the period 1960 to 1962 had significantly higher means on four of the five C.P.I. scales than did the males who also completed 3 or 4 semesters during the two-year period. The same holds for the female subjects on two of the five scales in 1962, and

TABLE 13

Sex Differences for C.P.I. Scale Means in 1960 and in 1962 for 452 Males and 339 Females Enrolled for 3 or 4 Semesters 1960 to 1962

	1960				1962			
Scale Variable	Male Mean	Female Mean	t	P	Male Mean	Female Mean	t	P
Sociability	23.30	23.36	-.15	ns	24.42	24.33	.22	ns
Self Control	25.79	28.02	-3.94	.01	27.30	28.85	-2.68	.01
Ach Via Indep	17.49	18.27	-2.55	.05	20.04	20.63	-1.91	ns
Intell Effic	34.85	36.11	-2.92	.01	37.74	38.47	-1.78	ns
Responsibility	28.68	31.47	-8.36	.01	30.10	32.22	-6.35	.01

TABLE 14

Sex Differences in Mean Differences 1960-1962 on C.P.I. Scales for 452 Males and 339 Females Enrolled for 3 or 4 Semesters 1960 to 1962

Scale Variable	1960-1962 Male Mean Diff.	1960-1962 Female Mean Diff.	t	P
Sociability	1.12	.97	.50	ns
Self Control	1.51	.83	1.39	ns
Ach Via Indep	2.55	2.36	.70	ns
Intell Effic	2.89	2.36	1.63	ns
Responsibility	1.42	.75	2.29	.05

females had the highest mean on two more scales though the differences did not reach acceptable levels of statistical significance. It would appear from these analyses that the collegiate experience does not alter appreciably measured sex differences on the C.P.I. scales. The 1960 to 1962 mean differences reported in Table 14 indicate that the males had greater increases in mean scores than did the females, but that only on the Responsibility Scale was the male mean increase signficantly greater.

A summary of results for Part A: Changes in personality traits indicates that all sex and educational attainment groups changed significantly in the direction of greater sociability, self control, achievement via independence, intellectual efficiency, and responsibility. In addition, those subjects completing 3 or 4 semesters of college in the two-year period had slightly higher means in 1960 on two of the five scales compared with the 1960 status of the other subjects completing either 1 or 2 semesters or no semesters of college during the same period. For the males, 1962 respondents were statistically significantly different from non-respondents of 1962 on 1960 measures whereas this was not the case with 1962 respondent female subjects compared with non-respondents of 1962. In terms of sex differences for those completing 3 or 4 semesters of enrollment in the two-year period, females had the higher mean on four of the scales in 1960 and again in 1962.

Part B: Changes in ideology

To test hypotheses 7 and 8 (that males and females enrolled in junior college for 3 or 4 semesters of a two-year period do not change significantly in measured dogmatism over the two-year period), mean 1960 scores from the Rokeach Dogmatism Scale were compared with mean 1962 scores on the same scale for 448 males and 340 females enrolled for 3 or 4 semesters over the two-year period. Tests of the significance of the differences for correlated means were used to test these hypotheses. Table 15 contains the information from these analyses.

TABLE 15

Differences in D Scale Means 1960-1962 for 448 Males and 340 Females Enrolled for 3 or 4 Semesters 1960 to 1962

	1960 Mean	1960 Sigma	1962 Mean	1962 Sigma	r 60-62	t	P
Males	162.37	26.91	151.96	27.13	.50	8.19	.01
Females	153.79	25.80	147.02	25.39	.45	4.65	.01

As is readily seen, the males and the females enrolled for 3 or 4 semesters during the two-year period change significantly on the D Scale, and in the same direction. Subjects reported on in Table 15 show a significant decrease in dogmatism over the two-year period, and hypotheses 7 and 8 are rejected.

In order to test hypotheses 9 and 10 (that males and females enrolled in junior college for 1 or 2 semesters of a two-year period do not change significantly in measured dogmatism over the two-year period), mean 1960 scores on the D Scale were compared with mean 1962 scores on the same scale for 352 males and 253 females enrolled for 1 or 2 semesters over the two-year period. Tests of the significance of the difference for correlated means were used to test hypotheses 9 and 10. The results of these tests are found in Table 16.

TABLE 16

Differences in D Scale Means 1960-1962 for 352 Males and 253 Females Enrolled for 1 or 2 Semesters 1960 to 1962

	1960 Mean	1960 Sigma	1962 Mean	1962 Sigma	r 60-62	t	P
Males	164.54	28.26	155.78	28.58	.44	5.47	.01
Females	159.40	26.89	148.94	28.07	.54	6.32	.01

The t-ratios and probability values in Table 16 indicate that both the male and female groups of subjects enrolled for 1 or 2 semesters in junior college over the two-year period change significantly in dogmatism. The direction of the change is the same for both groups with a significant decrease in dogmatism. Hypotheses 9 and 10 have been rejected.

Hypotheses 11 and 12 (that males and females enrolled in college for no semesters of a two-year period do not change significantly in measured dogmatism over the two year-period) were tested by comparing 1960 means on the D Scale with the 1962 means from the same scale for 133 males and 171 females who were not enrolled in college at all over the two-year period. Tests of the significance of the differences for correlated means were used to test hypotheses 11 and 12. Table 17 summarizes the results of these correlated t-tests. The obtained t-ratios and probability values for these reported in Table 17 indicate quite clearly that both the male and female "no semesters" or non-college groups change significantly in measured dogmatism. In both cases, the change is in the direction of significant decrease in dogmatism. Hypotheses 11 and 12 have been rejected; there is significant change.

TABLE 17

Differences in D Scale Means 1960-1962 for 133 Males and 171 Females Enrolled for No Semesters 1960 to 1962

	1960 Mean	1960 Sigma	1962 Mean	1962 Sigma	r 60-62	t	P
Males	167.36	34.22	153.65	29.89	.55	5.20	.01
Females	161.53	31.20	151.31	28.53	.48	4.40	.01

As was the case with reporting the various results obtained with the C.P.I. Scales, a summary table has been prepared to facilitate interpretation of the change data for the dogmatism scale. Table 18 is such a summary table with an indication of the direction of the changes, the magnitude of the changes, and the obtained significance level of the changes for all subjects categorized by sex and educational attainment during the two-year period of this study.

TABLE 18

Summary of the Amount, Direction and Significance Level of Changes on the Dogmatism Scale 1960 - 1962 for All Subjects Categorized by Sex and Educational Attainment from 1960 to 1962

	Males		Females	
Semesters Enrolled 1960-1962	Mean Diff.	P	Mean Diff.	P
3 or 4	-10.41	.01	-6.77	.01
1 or 2	-8.76	.01	-10.46	.01
0	-13.71	.01	-10.22	.01

The same type of interpretation for the summary table which was made for the C.P.I. data is made for the summary data on the D Scale. It will be noted that there were six 1960 to 1962 comparisons made, and all reached acceptable levels of statistical significance. In addition, all of the comparisons yield mean differences in the same direction. These analyses from the D Scale strongly indicate that, for our subjects, there is a general ideological development underway apart from the amount of collegiate experience of the groups of subjects. This set of results is similar to those obtained by Plant (1962) after both a two-year and four-year period using the D Scale with subjects from a four-year college, and employing the same design as that employed in this study.

Three additional analyses were made of the data from the D Scale.

(a). An analysis was made of the 1960 status of those who responded in 1962 but who differed in educational attainment during the two-year period.

(b). An analysis was made of the 1960 status of 1962 respondents compared with that of 1962 non-respondents categorized into educational attainment groups.

(c). An analysis was made of sex differences as of 1960, as of 1962, and for mean differences '60 to '62 for those subjects completing 3 or 4 semesters of college enrollment during the two years.

To determine the initial status of those subjects who responded in 1962, but who differed in educational attainment during the two-year period, analyses of variance for the 1960 means were undertaken for males and females on the D Scale. Two analysis of variance problems resulted, one for the male means and one for the female means. The obtained F-ratio for males was not statistically significant, but the obtained F-ratio for females was significant at the .01 level. The females who completed 3 or 4 semesters had the lowest 1960 mean, the females completing 1 or 2 semesters had the next lowest mean in 1960, and the "no semester" females had the highest 1960 mean. The same hierarchy of means on the 1960 D Scale administration was obtained for males, but the differences did not yield a significant F-ratio.

An examination of whether or not participants in this study (with participants defined as those who responded in 1962) differed in initial mean status from non-participants was made. Table 19 summarizes the 1960 status of respondent vs. non-respondent groups on the D Scale.

TABLE 19

1960 Dogmatism Scale Means for all Male and all Female 1962 Respondents Compared with all Male and all Female 1962 Non-respondents Categorized by Semesters of Enrollment 1960 to 1962

	1962 Respondents			1962 Non-respondents				
Semesters Enrolled	N	Mean 1960	Sigma 1960	N	Mean 1960	Sigma 1960	t	P
Males								
3 or 4	448	162.37	26.91	521	169.34	25.54	-4.05	.01
1 or 2	352	164.54	28.26	734	168.18	27.43	-1.94	ns
0	133	167.36	34.22	389	169.44	26.12	-.23	ns
Females								
3 or 4	340	153.79	25.80	255	161.42	27.68	-3.39	.01
1 or 2	253	159.40	26.89	458	162.02	31.23	-1.13	ns
0	171	161.53	31.20	357	166.12	29.34	-1.60	ns

Of the six respondent vs. non-respondent comparisons, two of the uncorrelated t-ratios were significant beyond the .01 level. Respondent males and females who completed 3 or 4 semesters had significantly lower 1960 means on the D Scale than did the non-respondents of 1962 who also had completed 3 or 4 semesters during the two-year period. Although all differences were in the direction of lower respondent than non-respondent means, the other four comparisons were not statistically significant.

To determine whether or not the collegiate experience appreciably alters sex differences on the D Scale, statistical comparisons of the differences between D-Scale means for males and females were computed for the 1960 and 1962 means for 448 males and 340 females completing 3 or 4 semesters of enrollment during the two-year period of this study. Table 20 contains both the 1960 and 1962 comparisons.

TABLE 20

Sex Differences 1960 and 1962 on the D Scale for 448 Males and 340 Females Enrolled for 3 or 4 Semesters 1960 to 1962

	1960		1962	
	Males	Females	Males	Females
Number	448	340	448	340
Mean	162.37	153.79	151.96	147.02
Sigma	26.91	25.80	27.13	25.39
t-Ratio	4.51		2.60	
P of t	.01		.01	

In 1960, the females who later finished 3 or 4 semesters of junior college enrollment during the two-year period 1960 to 1962 had a significantly lower mean on the D Scale than did the males who also completed 3 or 4 semesters during the two-year period. The same results obtain for the 1962 comparison: the females had a significantly lower mean. As was the case with the C.P.I. results, it would appear from these analyses that the collegiate experience does not alter appreciably measured sex differences on the D Scale.

A summary of the results for Part B: Changes in ideology, yields the general observation that all sex and educational attainment groups change significantly in the direction of decreased dogmatism. Those subjects who completed 3 or 4 semesters of junior college enrollment in the two-year period had lower means in 1960 on the D Scale than did the other educational attainment groups. Males and females who completed 3 or 4 semesters and responded in 1962 had lower means in 1960 than did male and female non-respondents of 1962 who also had completed 3 or 4 semesters of college enrollment during the two-year period. The other educational attainment groups who responded in 1962 were not significantly different in 1960 status on the D Scale from 1962 non-respondents in the same educational attainment groups. It was the case, though, that non-respondents in 1962 had higher means in 1960 than did respondents of 1962. In terms of sex differences for those completing 3 or 4 semesters of enrollment in the two-year period, females had a significantly lower D Scale mean than did males in 1960 and again in 1962.

Part C: Changes in Values

In order to test hypotheses 13 and 14 (that males and females enrolled in junior college for 3 or 4 semesters of a two-year period do not change significantly in measured values over the two-year period), mean 1960 scores on the six scales of the Allport, Vernon and Lindzey Study of Values were compared with mean 1962 scores on the same scales for 440 males and 336 females enrolled for 3 or 4 semesters over the two-year period. Tests of the significance of the differences for correlated means were used to test these hypotheses. Tables 21 and 22 contain the relevant data for these comparisons for males and females respectively.

TABLE 21

Differences in A-V-L Scale Means 1960 - 1962 for 440 Males who Were Enrolled for 3 or 4 Semesters 1960 to 1962

Scale Variable	Mean 1960	Sigma 1960	Mean 1962	Sigma 1962	r 60-62	t	P
Theoretical	45.07	7.02	44.33	7.35	.56	-2.30	.05
Economic	42.63	7.08	41.78	7.79	.48	-2.37	.05
Aesthetic	35.17	7.54	37.21	8.76	.52	5.31	.01
Social	35.26	6.30	36.45	6.80	.46	3.69	.01
Political	42.74	6.05	42.06	6.68	.52	-2.27	.05
Religious	39.03	8.43	38.07	9.59	.66	-2.70	.01

The t-ratios and probability values for these in Table 21 indicate that there is change on all of the scales for the males completing 3 or 4 semesters of enrollment from 1960 to 1962. There was a

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significant increase in Aesthetic and Social means for the males and a significant decrease in Theoretical, Economic, Political, and Religious scale means. Hypothesis 13 is rejected; there is significant change associated with 3 or 4 semesters of enrollment in junior college for the male subjects.

TABLE 22

Differences in A-V-L Scale Means 1960 - 1962 for 336 Females who Were Enrolled for 3 or 4 Semesters 1960 to 1962

Scale Variable	Mean 1960	Sigma 1960	Mean 1962	Sigma 1962	r 60-62	t	P
Theoretical	38.72	6.59	38.66	7.05	.51	-.18	ns
Economic	38.47	6.73	37.49	6.98	.54	-2.74	.01
Aesthetic	39.23	7.86	42.02	8.67	.58	6.73	.01
Social	40.44	6.52	40.72	6.33	.54	.86	ns
Political	38.55	6.24	38.07	6.10	.44	-1.36	ns
Religious	44.46	8.23	42.85	8.69	.54	-3.65	.01

The t-ratios in Table 22 indicate that there is some significant change for the female subjects who completed 3 or 4 semesters of enrollment from 1960 to 1962. There was a significant increase on the Aesthetic scale, and a significant decrease on the Economic and Religious scales for the female subjects. Hypothesis 14 is partially rejected; there is partial change associated with 3 or 4 semesters of enrollment in junior college for the female subjects.

To test hypotheses 15 and 16 (that males and females enrolled for 1 or 2 semesters in junior college during a two-year period do not change significantly in measured values over the two-year period), mean 1960 scores on the six A-V-L scales were compared with mean 1962 scores on the same scales for 344 males and 240 females who were enrolled for 1 or 2 semesters over the two-year period. As was the case in the other comparisons, correlated t-tests were used to test the hypotheses. The results of these statistical tests are found in Tables 23 and 24 for the 1 or 2 semester males and females respectively.

TABLE 23

Differences in A-V-L Scale Means 1960 - 1962 for 344 Males who Were Enrolled for 1 or 2 Semesters 1960 to 1962

Scale Variable	Mean 1960	Sigma 1960	Mean 1962	Sigma 1962	r 60-62	t	P
Theoretical	44.70	6.75	44.75	6.89	.48	.14	ns
Economic	42.67	7.33	43.43	7.73	.43	1.75	ns
Aesthetic	34.42	8.08	34.80	8.01	.56	.93	ns
Social	35.04	6.74	35.99	6.43	.47	2.62	.01
Political	43.34	6.74	42.92	6.36	.43	-1.11	ns
Religious	38.22	8.95	38.23	9.05	.50	.01	ns

The results reported in Tables 23 and 24 indicate that, for males, there is a significant increase in Social scale means over the two-year period and no significant change on the other five A-V-L scale variables. For the females enrolled 1 or 2 semesters, there is a significant decrease in Religious scale means, and no significant change on the other five A-V-L scale variables. We are inclined to accept hypotheses 15 and 16; there is no appreciable change in value scores associated with enrollment in junior college for 1 or 2 semesters of the two-year period of this study.

TABLE 24

Differences in A-V-L Scale Means 1960 - 1962 for 240 Females who Were Enrolled 1 or 2 Semesters 1960 to 1962

Scale Variable	Mean 1960	Sigma 1960	Mean 1962	Sigma 1962	r 60-62	t	P
Theoretical	38.55	6.59	38.72	6.68	.53	.43	ns
Economic	38.41	7.16	38.50	6.99	.50	.20	ns
Aesthetic	39.22	7.53	39.76	8.89	.65	1.21	ns
Social	40.47	6,89	41.17	7.17	.52	1.58	ns
Political	38.73	6.76	38.47	7.01	.43	-.53	ns
Religious	44.05	9.18	42.88	8.55	.53	-2.12	.05

In order to test hypotheses 17 and 18 (that males and females enrolled in junior college for no semesters of a two-year period do not change significantly in measured values over the two-year period), mean 1960 scores on the six scales of the A-V-L were compared with mean 1962 scores on the same scales for 131 males and 163 females who were not enrolled in college at all over the two-year period. Tests of the significance of differences for correlated means were used to test these hypotheses. The relevant data for the "no semester" males are found in Table 25, and for the "no semester" females in Table 26.

TABLE 25

Differences in A-V-L Scale Means 1960 - 1962 for 131 Males who Were Enrolled for No Semesters 1960 to 1962

Scale Variable	Mean 1960	Sigma 1960	Mean 1962	Sigma 1962	r 60-62	t	P
Theoretical	43.81	6.77	44.83	7.18	.49	1.65	ns
Economic	41.51	8.08	41.89	8.52	.62	.59	ns
Aesthetic	35.99	8.53	37.11	10.12	.62	1.57	ns
Social	35.07	6.50	35.99	6.63	.48	1.56	ns
Political	43.45	6.88	43.50	6.59	.57	.09	ns
Religious	38.58	10.14	36.59	10.05	.69	-2.90	.01

TABLE 26

Differences in A-V-L Scale Means 1960 - 1962 for 163 Females who Were Enrolled for No Semesters 1960 to 1962

Scale Variable	Mean 1960	Sigma 1960	Mean 1962	Sigma 1962	r 60-62	t	P
Theoretical	38.63	6.95	39.74	6.79	.50	2.05	.05
Economic	38.53	6.45	39.26	8.21	.53	1.27	ns
Aesthetic	38.82	7.93	38.04	8.26	.62	-1.40	ns
Social	40.88	7.13	41.19	7.21	.45	.52	ns
Political	37.92	5.62	38.71	6.43	.45	1.57	ns
Religious	44.96	8.08	43.40	8.19	.53	-2.41	.05

The t ratios and probability values for these in Tables 25 and 26 indicate that for males with no collegiate education during the two years, there is a significant decrease in Religious scale means, and no significant change on the other five scale variables. For females with no collegiate education during the two years of this study, there was a significant increase in Theoretical means, a significant decrease in Religious scale means, and no significant change on the other four scale variables over the two-year period. We are inclined to accept hypotheses 17 and 18: there is no appreciable change in A-V-L scale scores for subjects with no semesters of junior college enrollment during the two-year period of the study.

Up to the point of reporting results for the A-V-L, it seemed quite clear that all sex and educational attainment groups changed significantly and in the same direction irrespective of educational attainment during the two-year period of this research. With the A-V-L results, the number of significant changes is greater for the 3 or 4 semesters males and females than for the 1 or 2 or no semesters males and females. It would appear that the A-V-L results are the only results indicating change with college education and little or no change without education. An analysis of the ranks of the mean scale scores for the several educational attainment groups makes this last observation questionable.

As a psychometric device, the A-V-L is a measure of the relative strength of the six values for any individual, and the means for groups indicate the relative strength of the values for the groups in question. We have ranked the absolute magnitude of the means for the six groups on the 1960 means and on the 1962 means. Tables 27 and 28 contain the ranks 1960 and 1962 for the males and females respectively.

TABLE 27

Rank Order of A-V-L Scale Means 1960 and 1962 for all Males Categorized by Educational Attainment During the Period 1960 to 1962

	3 or 4 Semesters N=440		1 or 2 Semesters N=344		0 Semesters N=131	
	Rank 1960	Rank 1962	Rank 1960	Rank 1962	Rank 1960	Rank 1962
Theoretical	1	1	1	1	1	1
Economic	3	3	3	2	3	3
Aesthetic	6	5	6	6	5	4
Social	5	6	5	5	6	6
Political	2	2	2	3	2	2
Religious	4	4	4	4	4	5

Inspection of the rank orders for the three groups of males differing in educational attainment during the two years of the study yields some general observations relevant to the matter of change in values with education. First, each of the three male groups had the Theoretical Scale mean as the highest mean in 1960 and again in 1962. Second, in each of the three male groups there is only one change in the ranks from 1960 to 1962 irrespective of statistically significant differences in mean scores over the two-year period. Third, each male group had the same three scales in the highest three ranks in 1960 and again in 1962, and the same three scales in the lowest three ranks in 1960 and again in 1962. Inspection of the rank orders for the three groups of females differing in educational

TABLE 28

Rank Order of A-V-L Scale Means 1960 and 1962 for all Females Categorized by Educational Attainment During the Period 1960 to 1962

	3 or 4 Semesters N=336		1 or 2 Semesters N=240		0 Semesters N-163	
	Rank 1960	Rank 1962	Rank 1960	Rank 1962	Rank 1960	Rank 1962
Theoretical	4	4	5	4	4	3
Economic	6	6	6	5	5	4
Aesthetic	3	2	3	3	3	6
Social	2	3	2	2	2	2
Political	5	5	4	6	6	5
Religious	1	1	1	1	1	1

attainment during the two years yields some similar generalizations. First, each of the three female groups had the Religious Scale mean as the highest mean in 1960 and again in 1962. Second, unlike the male subjects there was an increase in the number of changes in ranks associated with decrease in the amount of education. There was one change in ranks for the 3 or 4 semester females, two changes in ranks for the 1 or 2 semester females, and three changes in ranks for the no-semester females. Third, with the exception of the no-semester group the female groups had the same three scales in the highest three ranks in 1960 and again in 1962, and the same three scales in the lowest three ranks in 1960 and again in 1962.

The analysis of ranks for the three male and three female groups seems to indicate that if there is a relative change in values associated with increments of college (as concluded from one set of analyses) that the change is minimal. The changes reported are not so great as to make the 3 or 4 semester subjects markedly different in relative strength of values from those with less college education or none at all during the two-year period.

As was the case with the C.P.I. and D Scale data, additional analyses of the obtained A-V-L data were made.

(a). An analysis was made of the 1960 status of those who responded in 1962 but who differed in educational attainment during the two-year period.

(b). An analysis was made of the 1960 status of 1962 respondents compared with that of 1962 non-respondents categorized into educational attainment groups.

(c). An analysis was made of sex differences as of 1960 and as of 1962 for those subjects completing 3 or 4 semesters of college enrollment during the two years.

To determine the initial status of those who responded in 1962 but who differed in educational attainment during the two-year period, analyses of variance for the 1960 means were undertaken for males and for females on each of the six A-V-L scales. As an example of the procedure, the analysis of variance was computed for the three 1960 means on the Theoretical Scale for the 440 males enrolled 3 or 4 semesters, the 344 males enrolled 1 or 2 semesters, and for the 131 males enrolled for no semesters 1960 to 1962. Twelve analysis of variance problems resulted: one for each of the A-V-L scales for each sex. None of the obtained F-ratios reached the .05 level of statistical significance for either the males or the females. The groups differing in educational attainment during the period 1960 to 1962 and who responded in 1962 did not differ significantly on A-V-L means in 1960.

With respect to the question of whether or not 1962 respondents were different from 1962 non-respondents in terms of 1960 status on the A-V-L scales, thirty-six uncorrelated t-tests were undertaken. The significance tests were undertaken for each sex and educational attainment group of respondents of 1962 compared with non-respondents of 1962 on each of the A-V-L scale means of 1960. There were five comparisons for the male groups and two comparisons for the female groups which reached the .05 level of significance or beyond. There seemed to be no consistency in these differences. That is, no scale or educational attainment group seemed to account for the differences obtained. We feel that any generalizations regarding values from this study are not restricted by gross dissimilarity in the initial characteristics of respondents as compared with non-respondents.

Some interest has centered on the matter of determining whether or not there were significant differences between the males and females on the 1960 A-V-L variables, and if so, whether or not these differences existed after two years of educational attainment in a two-year period. Statistical comparisons of the differences between uncorrelated A-V-L means for males and females have been computed for the 1960 and 1962 scores of 440 males and 336 females completing 3 or 4 semesters of college enrollment during the period 1960 to 1962. Table 29 contains these comparisons. It will be seen that all comparisons yield very significant t-ratios both in 1960 and again in 1962. The differences reported are similar in direction to differences reported for college students generally (Allport, et al., 1960). Inspection of Tables 27 and 28 will also point out the sex differences in terms of relative ranks. It would appear that a two-year collegiate experience does not change empirically established sex differences on the A-V-L.

TABLE 29

Sex Differences on A-V-L Scale Means in 1960 and in 1962 for 440 Males and 336 ~~Females~~ Enrolled for 3 or 4 Semesters 1960 to 1962

	1960				1962			
	Male Mean	Female Mean	t	P	Male Mean	Female Mean	t	P
Theoretical	45.07	38.72	12.96	.01	44.33	38.66	10.90	.01
Economic	42.63	38.47	8.28	.01	41.78	37.49	7.93	.01
Aesthetic	35.17	39.23	-7.28	.01	37.21	42.02	-7.60	.01
Social	35.26	40.44	-11.26	.01	36.45	40.72	-8.92	.01
Political	42.74	38.55	9.42	.01	42.06	38.07	8.56	.01
Religious	39.03	44.46	-8.97	.01	38.07	42.85	-7.16	.01

A summary of results for Part C: Changes in values indicates that there is some significant change in A-V-L variables for all groups over the two-year period. The number of changes is greatest for the males and females who were enrolled either 3 or 4 semesters during the two-year period of the study, but an analysis of the changes in relative strength of values for the several groups indicates that the changes reported are not really great. The rank orders of the values remain essentially constant for the three groups of males who differ in educational attainment, and to a lesser extent the same is true of the three groups of females. There were no significant differences in initial means for those subjects who responded in 1962 and who differed in educational attainment during the two-year period. There were some differences in initial status between the respondents of 1962 compared with the non-respondents of 1962, but these differences were neither large nor consistent enough to warrant restrictions upon the generalizations from the A-V-L results.

CHAPTER IV

SUMMARY AND CONCLUSIONS

This study was designed to determine whether or not there were changes in student personality, ideology, or values associated with a two-year experience in a public junior college.

In the summer and fall of 1960 a battery of psychological tests was administered to all persons applying for admission as college freshmen for the fall semester 1960 at one of six California, public, junior colleges. The battery consisted of five scales from the California Psychological Inventory (Gough, 1957), the Dogmatism Scale: Form E (Rokeach, 1956), and the Study of Values (Allport, et al., 1960). As a result of this initial testing in six junior colleges, usable responses were obtained from 4,506 would-be college freshmen, none of whom had completed any formal education beyond the twelfth grade.

In the spring of 1962, the same battery of psychological tests was sent through the mail to these 4,506 1960 subjects, and usable responses were obtained from 1,793 of the original group. In addition, approximately 600 of the sets of material were returned as undeliverable in the 1962 mailing. Of those presumably contacted, the per cent of return was approximately 46% of the initial group. Eighty of the 1962 respondents had to be eliminated from the two-year test and retest sample because of enrollment in a college other than one of the six from which data were originally obtained, because of insufficient or unscorable response, or because of an inability to properly identify the subject.

At the end of the two-year period, it was found that some of the subjects tested in 1960 and again in 1962 had not entered the particular junior college to which they had applied nor any other college or university during the two-year period of this study. These "non-college" subjects were considered as one type of comparison group subjects for the study. It was also found that not all 1960 junior college entrants retested in 1962 completed 3 or 4 semesters in the two-year period. These "some college" subjects were considered as another type of comparison group subjects for the study. Having groups of subjects differing in amount of educational attainment from 1960 to 1962 made it possible for us to more clearly study the "impact" or "effect" of the collegiate experience. We know of only one other study (Plant, 1962) in which control, or more accurately, comparison groups were included in the study design.

For the study of college effects, test and retest subjects were divided into sex and educational attainment groups. There were three groups of males differing in educational attainment during the two years: 452 enrolled for 3 or 4 semesters, 362 enrolled for 1 or 2 semesters, and 133 enrolled for no semesters. There were three groups of females differing in educational attainment during the two years: 339 enrolled for 3 or 4 semesters, 255 enrolled for 1 or 2 semesters, and 172 enrolled for no semesters. Male and female subjects were separated because significant sex differences in the personality, ideology, and values variables were found. Results for the two-year period were reported for all sex and educational attainment groups and for each part of the test battery.

To test the hypotheses that there were no significant differences between 1960 and 1962 means on the Sociability, Self Control, Achievement via Independence, Intellectual Efficiency, or Responsibility scales of the California Psychological Inventory for each of the six sex and educational attainment groups, t-tests for correlated means were computed. In all, there were thirty t-tests undertaken, and twenty-seven reached acceptable levels of statistical significance. All thirty mean differences were in the direction of higher 1962 than 1960 means. All group changes were statistically significant and in the same direction over the two-year period. The magnitude of the changes relative to the standard deviations of the means from which the mean differences were obtained were quite small though, and a question was raised about the importance or practicality of the changes. It was concluded that the California Psychological Inventory scale results indicated a general personality development under way apart from the amount of educational experience of the groups of subjects.

Three additional sets of analyses were made with the data from the C.P.I. scales: (1) an analysis of the initial status of those who responded in 1962 but who differed in educational attainment during the two-year period, (2) an analysis of initial status of 1962 respondents vs. 1962 non-respondents by sex and educational attainment, and (3) an analysis of sex differences for 1960 and 1962 for those subjects completing 3 or 4 semesters during the two-year period. From these analyses it was found that:

(1) Those 1962 respondents completing 3 or 4 semesters of college in the two-year period had slightly higher means

in 1960 on two of the five C.P.I. scales compared with the 1960 means of the other 1962 respondents completing either 1 or 2 semesters or no semesters of college during the same period.

(2a) Seven of the fifteen comparisons of 1960 status of 1962 male respondents vs. male non-respondents yielded significant t-ratios, and in all cases of significance, the 1962 respondents had higher means in 1960 than did the non-respondents.

(2b) One of the fifteen comparisons of 1960 status of 1962 female respondents vs. 1962 female non-respondents yielded a significant t-ratio.

(3) Females enrolled for 3 or 4 semesters compared with males enrolled for 3 or 4 semesters had the highest mean on four of the scales in 1960 and again in 1962.

It was concluded from these analyses that 1962 respondent males were statistically significantly different originally from 1962 non-respondent males, and hence might restrict somewhat the generalizations of the current study. This is not the case with the female groups. In addition, it seems that the two-year educational experience did not alter appreciably measured sex differences in personality traits.

To test the hypotheses that there were no significant differences between 1960 and 1962 means on the Dogmatism Scale for each of the six sex and educational attainment groups, t-tests for correlated means were computed. In all, there were six t-tests undertaken, and all six reached acceptable levels of statistical significance. All six mean differences were in the direction of lower 1962 means than 1960 means. All groups were said to have become significantly less dogmatic over the two-year period of the study irrespective of educational attainment. Again, the results from the

Dogmatism Scale indicated a general personality development under way apart from the amount of education of the groups of subjects.

Three additional sets of analyses were made with the data from the Dogmatism Scale: (1) an analysis of the 1960 status of those who responded in 1962 but who differed in educational attainment during the two-year period, (2) an analysis of 1960 status of 1962 respondents vs. 1962 non-respondents by sex and educational attainment, and (3) an analysis of sex differences for 1960 and 1962 for those subjects completing 3 or 4 semesters during the two-year period. From these analyses it was found that:

(1) Those female 1962 respondents completing 3 or 4 semesters of college in the two-year period had the lowest 1960 mean on the Dogmatism Scale compared with the means of the other 1962 respondents completing 1 or 2 semesters or no semesters during the same period. The F-ratio for the three means was significant. Male respondents of 1962 categorized into educational attainment groups did not differ significantly in 1960 means on the Dogmatism Scale.

(2) Two of the six comparisons of 1960 status of 1962 respondents vs. 1962 non-respondents yielded significant t-ratios: the respondent 3 or 4 semester males and females had lower means in 1960 than did the non-respondent males and females also completing 3 or 4 semesters.

(3) Females enrolled for 3 or 4 semesters compared with males enrolled for 3 or 4 semesters had the lowest mean on the Dogmatism Scale in 1960 and again in 1962.

It was concluded from these analyses that 1962 respondent males and females who completed 3 or 4 semesters in the two-year period were different originally from non-respondents of 1962 who completed 3 or 4 semesters, and hence restrict somewhat the generalizations of this study for these groups. In addition, it seems that the two-year educational experience did not alter measured sex differences in dogmatism.

To test the hypotheses that there were no significant differences between 1960 and 1962 means on the Study of Values scales for each of the six sex and educational attainment groups, t-tests for correlated means were computed. In all, thirty-six correlated t-tests were computed for the A-V-L comparisons, and fourteen of these reached acceptable levels of statistical significance. Nine of the significant changes occurred for the 3 or 4 semester males and females, two for the 1 or 2 semester males and females, and three for the "0" semester males and females. It appeared that these results (unlike those for the C.P.I. and D-Scale) indicated greater change in personality characteristics with a collegiate experience than with little or no collegiate experience. An analysis of the ranks of the mean scale scores for the several educational attainment groups though made this observation questionable. Ranking of the group means was possible because the A-V-L is a measure of the relative strength of the six value areas for the individual, and means for groups indicate the relative strength of the six value areas for the groups in question.

Inspection of the rank orders for the three groups of males and for the three groups of females yielded results relevant to the matter of changes associated with the differing amounts of education. For the males: (1) each of the three male groups had the Theoretical Scale mean as the highest mean in 1960 and again in 1962, (2) in each of the three male groups there was only one change in ranks from 1960 to 1962 irrespective of statistically significant differences in mean scores over the two-year period, and (3) each male group had the same three scales in the highest three ranks in 1960 and again in 1962, and the same three scales in the lowest three ranks in 1960 and again in 1962. For the females: (1) each of the three female groups had the Religious Scale mean as the highest mean in 1960 and again in 1962, (2) unlike the male subjects, there was an increase in the number of changes in ranks associated with decrease in the amount of education with one change in ranks for the 3 or 4 semester females, two changes in ranks for the 1 or 2 semester females, and three changes in ranks for the "0" semester females, and (3) with the exception of the "0" semester group, the female groups had the same three scales in the highest three ranks in 1960 and again in 1962, and the same three scales in the lowest three ranks in 1960 and again in 1962.

It was concluded from the two different analyses of the A-V-L data that if there is relative change in values associated with increments of college that the change is minimal. The statistically significant changes in mean scores reported were not so great so as to make the 3 or 4 semester subjects markedly different in relative strength of values from those with less college education or none at all during the period of this study.

As was the case with the C.P.I. and D-Scale data, three additional sets of analyses were made with the data from the A-V-L: (1) an analysis of the 1960 status of those who responded in 1962 but who differed in educational attainment during the two years of the study, (2) an analysis of 1960 status of 1962 respondents vs.

1962 non-respondents by sex and educational attainment, and (3) an analysis of sex differences for 1960 and 1962 for those subjects completing 3 or 4 semesters during the two-year period. From these analyses it was found that:

(1) Male respondents of 1962 categorized by educational attainment in a two-year period did not differ significantly in 1960 on any A-V-L scale, and the same was true of the 1962 female respondents categorized by educational attainment.

(2) Five of the eighteen comparisons of 1960 status of 1962 male respondents vs. 1962 male non-respondents yielded significant t-ratios, and two of the eighteen comparisons of 1960 status of 1962 female respondents vs. 1962 female non-respondents yielded significant t-ratios. No scale or educational attainment group seemed to account for the 1960 differences obtained.

(3) Males enrolled for 3 or 4 semesters compared with females enrolled for 3 or 4 semesters differed in 1960 and again in 1962 in the expected directions.

It was concluded from these analyses that 1962 respondents were not different originally from 1962 non-respondents, and hence generalizations from the A-V-L results of this study are not restricted to original differences between subjects of varying amounts of education during the two years. In addition, it seems that the two-year educational experience did not alter sex differences in values as measured by the A-V-L.

All other investigators of "college impact" have reported some measured non-intellectual effect of the collegiate experience upon students. Had we included only those subjects completing 3 or 4 semesters of junior college enrollment during the two-year period of this study, we would report much the same kind of finding as have others. Inasmuch as we have included subjects having less than 3 or 4 semesters of junior college enrollment, and subjects with no college enrollment during the two years, and find similar changes to those for the "two-year" groups, we have called the whole issue of "college impact" into question. Within the limits of our data and study design, it has been generally concluded that many of the changes attributed to the collegiate experience by others may be no more than developmental changes under way in young persons like those who aspire to college whether or not they attend college.

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APPENDIX A

TABLE 30

Range of Mean Differences '60-'62, Range of Sigmas of the Mean Differences '60-'62, and F-Ratios for the Mean Differences '60-'62 on all Test Variables for Six Groups of Males Completing 3 or 4 Semesters Enrollment 1960 to 1962

Scale Variable	Range M Diffs.	Range σ M Diffs.	F-Ratio M Diffs.	P	N-K
C.P.I.					
Sy	.20 to 2.33	3.73 to 4.43	2.90	.05	446
Sc	.16 to 3.56	5.76 to 7.31	2.15	NS	446
Ai	1.85 to 3.83	3.27 to 4.56	2.45	.05	446
Ie	2.02 to 3.68	4.15 to 5.88	.95	NS	446
Re	.58 to 1.96	3.28 to 4.74	1.57	NS	446
A-V-L					
Theor.	-1.79 to .40	5.44 to 7.66	1.40	NS	434
Econ.	-2.64 to 1.55	6.69 to 9.08	2.02	NS	434
Aesth.	1.11 to 4.14	6.74 to 9.30	1.14	NS	434
Soc.	-2.00 to 2.44	6.33 to 7.40	3.34	.01	434
Pol.	-1.91 to 1.26	5.40 to 7.03	2.58	.05	434
Rel.	-3.55 to 1.27	7.07 to 9.07	3.49	.01	434
Rokeach					
D	-15.82 to -6.86	22.04 to 33.87	1.91	NS	442

TABLE 31

Range of Mean Differences '60-'62, Range of Sigmas of the Mean Differences '60-'62, and F-Ratios for the Mean Differences '60-'62 on all Test Variables for Six Groups of Males Completing 1 or 2 Semesters Enrollment 1960 to 1962

Scale Variable	Range M Diffs.	Range σ M Diffs.	F-Ratio M Diffs.	P	N-K
C.P.I.					
Sy	.24 to 2.27	3.72 to 5.13	2.29	.05	356
Sc	.55 to 3.68	6.17 to 8.97	1.34	NS	356
Ai	1.27 to 2.88	3.52 to 4.94	1.08	NS	356
Ie	1.90 to 2.69	4.14 to 6.42	.10	NS	356
Re	.50 to 2.76	3.14 to 5.11	2.72	.05	356
A-V-L					
Theor.	-3.63 to 1.28	4.72 to 8.11	1.42	NS	338
Econ.	- .42 to 2.70	6.93 to 8.58	1.41	NS	338
Aesth.	-1.40 to 1.02	5.66 to 9.81	.72	NS	338
Soc.	- .10 to 1.62	5.02 to 7.16	.42	NS	338
Pol.	-2.48 to 1.28	5.30 to 7.80	2.35	.05	338
Rel.	-1.21 to 3.31	7.37 to 11.09	.88	NS	338
Rokeach					
D	-11.34 to - .84	19.91 to 32.02	.83	NS	346

TABLE 32

Range of Mean Differences '60-'62, Range of Sigmas of the Mean Differences '60-'62, and F-Ratios for the Mean Differences '60-'62 on all Test Variables for Four Groups of Males Completing No Semesters Enrollment 1960 to 1962

Scale Variable	Range M Diffs.	Range σ M Diffs.	F-Ratio M Diffs.	P	N-K
C.P.I.					
Sy	- .60 to 2.00	4.90 to 6.46	.63	NS	129
Sc	.75 to 2.00	5.66 to 6.88	.25	NS	129
Ai	1.69 to 2.27	2.86 to 4.05	.14	NS	129
Ie	.65 to 2.91	5.72 to 7.34	.70	NS	129
Re	1.56 to 5.40	4.45 to 9.98	2.02	NS	129
A-V-L					
Theor.	.13 to 3.00	6.18 to 7.26	.80	NS	127
Econ.	- .62 to .71	4.50 to 7.61	.23	NS	127
Aesth.	-1.37 to 1.83	4.81 to 8.68	.97	NS	127
Soc.	.01 to 2.33	5.09 to 7.38	.59	NS	127
Pol.	-1.04 to 3.20	3.19 to 6.66	.70	NS	127
Rel.	-5.00 to .25	7.44 to 9.97	1.56	NS	127
Rokeach					
D	-16.13 to -7.21	25.45 to 35.15	.49	NS	129

TABLE 33

Range of Mean Differences '60-'62, Range of Sigmas of the Mean Differences '60-'62, and F-Ratios for the Mean Differences '60-'62 on all Test Variables for Six Groups of Females Completing 3 or 4 Semesters Enrollment 1960 to 1962

Scale Variable	Range M Diffs.	Range σ M Diffs.	F-Ratio M Diffs.	P	N-K
C.P.I.					
Sy	.30 to 1.52	3.45 to 4.92	.46	NS	333
Sc	-1.62 to 2.52	5.73 to 7.39	2.84	.05	333
Ai	1.32 to 3.11	2.52 to 4.43	2.02	NS	333
Ie	1.19 to 3.41	4.22 to 5.86	1.13	NS	333
Re	- .04 to 1.52	3.48 to 4.05	1.48	NS	333
A-V-L					
Theor.	-1.05 to 4.58	6.38 to 7.02	2.63	.05	330
Econ.	- .23 to -1.58	4.19 to 6.91	.22	NS	330
Aesth.	.58 to 3.92	6.99 to 8.28	1.25	NS	330
Soc.	- .90 to 1.64	4.92 to 6.79	1.35	NS	330
Pol.	-3.13 to 1.28	5.47 to 7.14	3.59	.01	330
Rel.	-2.34 to - .20	6.78 to 9.93	.42	NS	330
Rokeach					
D	-12.48 to - .25	24.54 to 32.21	1.17	NS	334

TABLE 34

Range of Mean Differences '60-'62, Range of Sigmas of the Mean Differences '60-'62, and F-Ratios for the Mean Differences '60-'62 on all Test Variables for Six Groups of Females Completing 1 or 2 Semesters Enrollment 1960 to 1962

Scale Variable	Range M Diffs.	Range σ M Diffs.	F-Ratio M Diffs.	P	N-K
C.P.I.					
Sy	-1.00 to 2.05	3.59 to 4.80	2.13	NS	249
Sc	.10 to 3.81	5.94 to 9.18	1.29	NS	249
Ai	1.18 to 2.53	2.77 to 4.11	1.00	NS	249
Ie	1.12 to 4.02	3.70 to 5.74	1.49	NS	249
Re	.06 to 2.56	3.50 to 5.23	1.89	NS	249
A-V-L					
Theor.	-1.14 to 1.51	4.63 to 6.74	.54	NS	234
Econ.	-.60 to 1.12	6.04 to 7.79	.32	NS	234
Aesth.	-.47 to 2.39	4.79 to 7.59	1.25	NS	234
Soc.	.22 to 1.37	6.19 to 8.60	.13	NS	234
Pol.	-1.49 to 1.06	5.79 to 10.94	.82	NS	234
Rel.	-2.25 to .04	7.67 to 9.86	.41	NS	234
Rokeach					
D	-12.70 to -1.18	23.27 to 32.82	.76	NS	247

TABLE 35

Range of Mean Differences '60-'62, Range of Sigmas of the Mean Differences '60-'62, and F-Ratios for the Mean Differences '60-'62 on all Test Variables for Four Groups of Females Completing No Semesters Enrollment 1960 to 1962

Scale Variable	Range M Diffs.	Range σ M Diffs.	F-Ratio M Diffs.	P	N-K
C.P.I.					
Sy	.10 to 3.33	1.52 to 5.10	.50	NS	168
Sc	-.36 to 2.90	6.29 to 8.32	.80	NS	168
Ai	1.17 to 3.66	2.25 to 3.83	.48	NS	168
Ie	.08 to 3.00	4.44 to 6.49	1.02	NS	168
Re	.90 to 2.33	1.52 to 6.07	.92	NS	168
A-V-L					
Theor.	.91 to 4.66	2.88 to 7.24	.57	NS	159
Econ.	-1.78 to 1.33	1.73 to 7.49	1.07	NS	159
Aesth.	-2.35 to 2.00	6.60 to 7.56	.98	NS	159
Soc.	-.67 to 2.78	7.14 to 11.71	1.69	NS	159
Pol.	.04 to 5.00	5.40 to 9.91	.85	NS	159
Rel.	-5.00 to -.35	7.59 to 9.08	2.42	NS	159
Rokeach					
D	-24.55 to -7.89	12.59 to 31.16	1.93	NS	166

APPENDIX B

Reference list of studies with project data not reported in this final report:

Nelson, J. W. Correlation profile analyses of the California Psychological Inventory and the Study of Values. Unpublished masters thesis, San Jose State College, 1962.

Nix, Jean A. Non-intellectual characteristics of gifted and non-gifted college students. Unpublished masters thesis, San Jose State College, 1961.

Plant, W. T., & Telford, C. W. Contrasts between groups high and low in measured dogmatism. Paper read at Calif. State Psychol. Assoc., San Francisco, 1961.

Swenson, L. G. Personality differences between achievers and non-achievers matched on scholastic aptitude. Unpublished masters thesis, San Jose State College, 1962.

Thomas, H. A., Plant, W. T., & Telford, C. W. Contrasts between groups high and low in measured dogmatism but matched on scholastic aptitude. Unpublished study, San Jose State College, 1963.